

10/092,211 filed 03/05/2002  
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Reply to Office Action of 03/03/2006

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (previously presented) A method of filling at least one microfluidic element of a microfluidic device with a gas or fluid, the method comprising:  
    placing the microfluidic device in a vacuum chamber;  
    applying a vacuum to the vacuum chamber;  
    while the microfluidic device remains under vacuum, introducing the gas or fluid into the vacuum chamber such that the microfluidic device is submerged in the gas or fluid;  
    venting the at least one microfluidic element to the gas or fluid; and  
    filling the at least one microfluidic element with the gas or fluid.
2. (canceled)
3. (canceled)
4. (previously presented) The method of claim 1 wherein applying a vacuum comprises applying a vacuum between about 0 and 102 kPa.
5. (previously presented) The method of claim 1 wherein applying a vacuum comprises applying a vacuum between about 15 and 85 kPa.
6. (previously presented) The method of claim 1 wherein applying a vacuum comprises applying a vacuum between about 30 and 70 kPa.
7. (previously presented) The method of claim 1 wherein applying a vacuum comprises applying a vacuum between about 45 and 55 kPa.

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8. (previously presented) The method of claim 1 wherein applying a vacuum comprises applying a vacuum between about 0 and 5 kPa.

9. (previously presented) The method of claim 1 wherein filling the at least one microfluidic element with the gas or fluid comprises filling the at least one microfluidic channel with a degassed fluid.

10. (previously presented) The method of claim 1 wherein filling the at least one microfluidic element with the gas or fluid comprises filling the at least one microfluidic element with at least one fluid selected from a group consisting of water, buffer, EDTA solution, DMSO, PEG, polyacrylamide, and NaOH solution.

11. (previously presented) The method of claim 1 wherein filling the at least one microfluidic element with the gas or fluid comprises diffusing the gas or fluid into the at least one microfluidic element.

12. (previously presented) The method of claim 1 wherein the at least one microfluidic element is fluidly connected to an at least one capillary element, which element includes a capillary channel disposed therein.

13. (previously presented) The method of claim 1 wherein the at least one microfluidic element comprises a plurality of microfluidic channels.

14. (original) The method of claim 13 wherein the plurality of microfluidic channels are fluidly coupled to one or more micro-reservoirs.

15. (previously presented) The method of claim 1 wherein filling the at least one microfluidic element with the gas or fluid comprises filling the at least one microfluidic element with at least one inert gas.

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16. (previously presented) The method of claim 15 wherein the at least one inert gas is selected from a group consisting of carbon dioxide and nitrogen.

17. (previously presented) The method of claim 1 wherein filling the at least one microfluidic element with the gas or fluid comprises filling the at least one microfluidic element with both a gas and a fluid.

18-22 (canceled)

23. (currently amended) A system for filling a microfluidic element of a microfluidic device with a gas or a fluid, the system comprising:

- a) a chamber configured to receive the microfluidic device;
- b) a vacuum source which is fluidly coupled to the chamber and which is configured to apply a vacuum to the chamber; and
- c) at least one source of a gas or fluid which is fluidly coupled to the chamber and which is configured to introduce at least one of a gas or a fluid into the chamber; and
- d) a detector configured to monitor filling of the microfluidic element of the microfluidic device with the gas or fluid.

24. (currently amended) The system of claim 23 wherein the microfluidic device element comprises at least one microfluidic channel.

25. (original) The system of claim 23 wherein the vacuum source is applicable to apply a vacuum between about 0 and 102 kPa to the chamber.

26. (original) The system of claim 23 wherein the vacuum source is applicable to apply a vacuum between about 15 and 85 kPa to the chamber.

27. (original) The system of claim 23 wherein the vacuum source is applicable to apply a vacuum between about 30 and 70 kPa to the chamber.

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28. (original) The system of claim 23 wherein the vacuum source is applicable to apply a vacuum between about 0 and 5 kPa to the chamber.

29. (canceled)

30. (original) The system of claim 29 further comprising a processor operably coupled to the microfluidic device, wherein the processor comprises an instruction set for acquiring data from the detector and for controlling filling of the microfluidic device with the gas or the fluid.